

FINDINGS

THE BINATIONAL STRATEGY PESTICIDES REPORT

The Binational Toxics Strategy (BNS) identified twelve bioaccumulative substances having sufficient toxicity and presence in water, sediments and/or aquatic biota of the Great Lakes system to warrant concerted action to eliminate their input to the Great Lakes. They are called

Level I substances. Six of the substances are formerly used pesticides, and are the primary focus of the two governments' commitments related to pesticides. The Level I pesticides are aldrin, dieldrin, chlordane, DDT (plus metabolites DDE and DDD), mirex, and toxaphene. The BNS documents combine aldrin and dieldrin because aldrin is readily oxidized to dieldrin, and is rarely found in the environment.

The Level I pesticides are highly chlorinated compounds, with five or more chlorine atoms per molecule. They are bioaccumulative, and concentrate in fish and piscivorous birds, having been found to produce several negative effects on birds, including impaired reproduction due to egg shell thinning. They all have been shown to be probable carcinogens based upon laboratory studies with animals.

Historical Usage

The past usage of these pesticides was large enough to cause significant environmental contamination during the years of their use. DDT, the first large scale pesticide, is reported to have reached peak annual usage of some 80-85 million Kg in 1962. The usage of the other Level I pesticides peaked after DDT at somewhat lower rates. The pesticide uses were the only significant application for the Level I pesticides with the exception of mirex. About 25% of the mirex production was for pesticidal uses, the balance being used as a flame retardant.

Because of the negative environmental effects of these substances, the pesticide uses of all of the Level I pesticides have been canceled for domestic use in the U.S. The flame retardant uses of mirex were curtailed in the 1970's and replaced by other products. All but chlordane have not been in production in the U.S. for many years. Chlordane continued to be produced in the U.S. for export by the product's sole manufacturer, Velsicol Corporation, until 1997, when Velsicol announced that production of both chlordane and heptachlor would cease.

Trends in Environmental Loadings

While domestic production has ceased and pesticide uses have been canceled, these pesticides continue to have an environmental presence, and continue to be produced and used in other countries, contributing to long range transport and atmospheric deposition.

Sediment. The available dated sediment core data for the Level I pesticides show a general pattern of rising concentrations from the time of introduction to the peak use years, followed by gradually declining concentrations thereafter. Using the dated sediment cores as a reflection of

inputs, some scientists conclude that inputs have declined to the level where atmospheric deposition is now the dominant source of the Level I pesticides entering the Great Lakes.

Surface Water. The quantities of Level I pesticides remaining in the Great Lakes water were estimated to total about 22,500 Kg, based upon the most recent water concentration data.

Atmosphere. Atmospheric concentrations around the Great Lakes are being measured by the Integrated Atmospheric Deposition Network (IADN) at five master stations and several additional satellite stations covering the Great Lakes. The IADN data are available over time for dieldrin, the major chlordane components, and DDT and its metabolites, and show that atmospheric concentrations are declining. Projections from these data suggest that Virtual Elimination (when atmospheric concentrations fall below the detection level of 0.1 pg/m³) would be achieved in 2010 for DDT, 2060 for the DDT metabolite DDE and between 2010 and 2060 for dieldrin and chlordane.

Bioaccumulation. Level I pesticides are still present but declining in the tissues of fish and birds in the Great Lakes Basin. An example is the reduction in the concentration of DDT in Lake Michigan lake trout from about 20 ppm to 1 ppm over the period 1970 to 1992. The concentration of toxaphene in Lake Superior lake trout is an exception, which showed no significant change from 1982 to 1992; this is most likely a result of the higher and stable concentrations of toxaphene in Lake Superior water.

Bioaccumulation remains the principal concern relative to these pesticides. While water concentrations of these pesticides in the Great Lakes are well below drinking water standards, the concentrations in fish and wildlife are much higher. DDT is an example; fish tissue concentrations range from 0.19 to 1.5 ppm in the Great Lakes waters, which are more than one million times higher than the corresponding water concentrations in each Lake. There continue to be fish consumption advisories based on unacceptable levels of these pesticides in sport and commercial fish.

Reservoirs and Unused Stocks

There are over 100 National Priority List sites within the eight Great Lakes States which show contamination by one or more of the six pesticides. These sites represent point sources that are being addressed through the U.S. EPA Superfund Program.

Overall removals of Level I pesticides at waste pesticide collections (so called Clean Sweeps) have resulted in significant recoveries of unused stocks. A simple illustration of their significance is the fact that the reported quantities of Level I pesticides collected in the Great Lakes Basin are nearly twice the estimated quantities in the waters of the Five Great Lakes.

Options and Opportunities for Further Reductions

While the declining concentration trends for most of these substances is encouraging, and water concentration levels are well below drinking water standards, one or more of the Level I pesticides are still the subject of fish consumption advisories in each of the Great Lakes. Further declines are likely to be gradual, as net atmospheric and other inputs are balanced by removals by sedimentation and flow.

The processes available for further reductions are in place and on-going. These are:

1. Remediation of sites with contaminated soils and sediments under the Superfund Program.
2. Waste pesticide collections by the States to continue the removal of unused stocks.
3. The National PBT Initiative to reduce domestic emissions that can deposit in the Great Lakes.
4. International efforts (POPs Initiative) to reduce long range atmospheric transport.
5. Continued monitoring (IADN) with follow-up investigations of anomalous situations.

Addressing The Challenge!

All pesticide uses for all Level I pesticides have been canceled. The production facilities within the U.S. have been closed. Although evidence of purposeful releases has not been identified, the potential release from contaminated sites and remaining unused stocks is still possible; however, the declining concentrations indicate that such possible releases are likely to be small. Because some Level I pesticide concentrations in the Great Lakes are still above Water Quality Criteria, and fish advisories are required, continued monitoring is necessary. However, the options of site remediation, waste pesticide collection, and monitoring are in place and on-going.

For these reasons, we believe that the United States has met the principal intent of the Challenge, even though the statement "...no longer use or release..." can not be confirmed as long as unused stocks and contaminated sites exist.